REMARKS

This request for reconsideration is filed in response to the final Office Action dated July 9, 2009. For the following reasons this application should be allowed and the case passed to issue. Claims 5-8 and 13-16 are pending in this application. Claims 13 and 14 have been withdrawn pursuant to a restriction requirement. Claims 5-8, 15, and 16 are rejected. Claims 1-4 and 9-12 were previously canceled.

Claim Rejections Under 35 U.S.C. § 112

Claim 16 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite because the claim recites a Japanese Industrial Standard.

JIS SUJ2 is defined in the specification and one of ordinary skill in this art would know what JIS SUJ2 steel is comprised of, including the carbon content, as disclosed in the specification on page 17, line 20. Further, even without the disclosure on page 17, the recitation of JIS SUJ2 would be definite. As is well-established, claims are construed as of the time of the invention, i.e., as of the effective filing date of the patent application. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005); *PC Connector Solutions LLC v. Smartdisk Corp.*, 406 F.3d 1359, 1362-63 (Fed Cir. 2005). Therefore, as one of ordinary skill in this art would readily appreciate, reference to an industrial specification in a patent application refers to the version of the industrial specification in effect at the time of filing the application.

Claim Rejections Under 35 U.S.C. § 103

Claims 5-8 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Takemura et al. (US 6,440,232) (Takemura et al. ('232)) in view of Takemura et al. (US 6,224,688) (Takemura et al. ('688)). The Examiner considered a transmission component as a component

capable of transmitting a force. The Examiner believed that the non-diffusible hydrogen content of the Takemura et al. ('232) material is zero. The Examiner acknowledged that Takemura et al. ('232) did not disclose a grain size number exceeding 10. The Examiner relied on the Takemura et al. ('688) teaching of a rolling bearing with a nitriding layer having a grain size of 11 or above. The Examiner believed the fracture stress may be inherent.

Claims 5-8, 15, and 16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Takemura et al. ('232) in view of Takemura et al. ('688) and further in view of Maeda et al. (US 6,423,158). The Examiner recognized that Takemura et al. ('232) and ('688) do not disclose a tapered roller bearing having an inner ring, an outer ring, and a tapered roller. The Examiner relied on the teaching of Maeda et al. to conclude that it would have been obvious to modify the bearing of Takemura et al. ('688) by using a tapered roller to support both radial and thrust loads.

The asserted combination of references would not provide a transmission component incorporated into a transmission capable of changing a rotational speed of an output shaft relative to a rotational speed of an input shaft by means of mesh of toothed wheels or a tapered roller bearing, having the claimed grain size number, non-diffusible hydrogen content, and fracture stress value, as required by claims 5 and 15.

Claim 5 recites a configuration including the following:

A. a transmission component incorporated into a transmission capable of changing a rotational speed of an output shaft relative to a rotational speed of an input shaft by means of mesh of toothed wheels,

B. a nitriding layer formed by a carbonitriding process at a surface layer,

C. a fracture stress value of at least 2650 MPa,

D. an austenite grain with a grain size number of 11 or greater, and

E. a non-diffusible hydrogen content of at most 0.5 ppm.

Claim 15 requires limitations B-E above.

Takemura et al. (`232) disclose a toroidal-type continuously variable transmission (CVT). The toroidal-type CVT does not change a rotational speed of an output shaft relative to a rotational speed of an input shaft by means of an output shaft relative to a rotational speed of an input shaft by means of a mesh of toothed wheels. Takemura et al. (`232) thus do not disclose requirement A.

Takemura et al. (`232) also do not disclose a fracture stress value of at least 2650 MPa and an austenite grain with a grain size number of 11 or greater. Thus, Takemura et al. (`232) do not disclose requirements C and D.

Furthermore, while Takemura et al. (`232) disclose an amount of diffusible hydrogen in Table 2, Takemura et al. (`232) do not teach a **non-diffusible hydrogen content**. Therefore, Takemura et al. (`232) do not disclose requirement E.

Likewise, Takemura et al. (`688) disclose a transmission, but do not describe a transmission that changes a rotational speed of an output shaft relative to a rotational speed of an input shaft by means of an output shaft relative to a rotational speed of an input shaft by means of a mesh of toothed wheels. Takemura et al. (`688), thus do not disclose requirement A.

Takemura et al. (`688) also do not disclose a fracture stress value of at least 2650 MPa and a non-diffusible hydrogen content of at most 0.5 ppm. Therefore, Takemura et al. (`688) do not disclose requirements C and E.

Furthermore, while Takemura et al. (`688) disclose the term "carbonitriding" (para. [0008]), the only embodiments teach either conventional heat treatments (hardening at 840 °C, oil quenching, and tempering at 170 °C), or a carburizing heat treatment, not carbonitriding.

Therefore, Takemura et al. ('688) do not disclose that the grain size numbers in Table 2 is obtained by carbonitriding. In other words, Takemura et al. ('688) do not disclose carbonitrided steel having an austenite grain with a grain size number of 11 or greater. Thus, Takemura et al. ('688) fail to teach or suggest requirements A-E.

Because Takemura et al. ('232) do not teach requirements A, C, D, and E, and Takemura et al. ('688) do not teach requirements A, B, C, D, and E, the combination of Takemura et al. ('232) and ('688) cannot teach requirements A, C, D, and E.

The asserted combination of references do not suggest a transmission component of a transmission capable of changing a rotational speed of an output shaft relative to a rotational speed of an input shaft by means of mesh of toothed wheels or a tapered roller bearing having a nitriding layer formed by a carbonitriding process at a surface layer, a fracture stress value of at least 2650 MPa, an austenite grain with a grain size number of 11 or greater, and a non-diffusible hydrogen content of at most 0.5 ppm, as required by claims 5 and 15, respectively.

The secondary quenching temperatures of Takemura et al. ('232) would not provide the claimed grain size number. As shown in Table 1, secondary quenching at the temperatures disclosed by Takemura et al. ('232) produce larger grain sizes. Further, it would not have been obvious to combine Takemura et al. ('232) and Takemura et al. ('688) to obtain the claimed component because Takemura et al. ('232) teach carbonitriding and Takemura et al. ('688) teach away from carbonitriding. Furthermore, even if Takemura et al. ('232) and Takemura et al. ('688) were combined, the claimed components would not result. Maeda et al. do not cure the deficiencies of Takemura et al. ('232) and ('688).

The Examiner's assertion that the non-diffusible hydrogen content in the cited references would have been zero because it is not disclosed in the cited references is traversed. As shown

in Table 1, conventional quenching techniques and conventional carbonitrided methods provide components with non-diffusible hydrogen. Thus, the Examiner does not have a basis for asserting that because a reference is silent about non-diffusible hydrogen it does not contain non-diffusible hydrogen.

It would have been further unobvious to combine Takemura et al. (`232) and Takemura et al. (`688), as asserted by the Examiner, to obtain the claimed component because Takemura et al. (`232) teach carbonitriding and Takemura et al. (`688) teach away from carbonitriding. Takemura et al. (`688) teach that carbonitriding "costs a great deal" and "cannot be expected to obtain fine crystal grains" (column 2, lines 52 to 56). Further, even if Takemura et al. (`232) and Takemura et al. (`688) were combined the claimed component would not result, as the secondary quenching temperatures of Takemura et al. (`232) would produce grain sizes that are too large. Maeda et al. do not cure the deficiencies of Takemura et al. (`232) and (`688), as Maeda et al. do not suggest the transmission component having a grain size number of 11 or greater and a non-diffusible hydrogen content of at most 0.5 ppm.

In the present invention, it has been discovered that the thermal treatment, as shown in Figs. 3 and 4, provides a steel that has the following three characteristics: (1) a content of non-diffusible hydrogen of at most 0.5 ppm, (2) a fracture stress value of at least 2650 MPa, and (3) an austenite grain with a grain size of 11 or greater. The cited prior art references do not suggest this unexpected combination of properties. Furthermore, the present inventors have found that such steel applied to a transmission configured with meshing gears or tapered roller bearings allows the transmission to have improved anti-crack strength, dimensional stability, and fatigue life.

The Examiner maintained that Applicants have the burden of proving that the claimed properties are not inherent. However, the Examiner has not satisfied his burden of maintaining the rejections based on inherency. In order to assert inherency, the asserted inherent property **must necessarily be present**. The mere belief that it **may be inherent is not sufficient**. Though, the Examiner has not satisfied the burden of maintaining the above rejections based on inherency, the data in Table 1 establishes that Applicants have satisfied the burden of proving that the non-diffusible hydrogen content and fracture stress are not inherent properties of the prior art.

The Examiner alleged that Applicant's arguments filed March 17, 2009 have been fully considered. However, the Examiner did not address the arguments previously presented concerning the data in Table 1, and instead reiterated that Applicant's arguments fail to meet the burden of evidence required to overcome the presumption of inherency. The Examiner did not point out any deficiencies in the arguments. Thus it appears the Examiner has not considered the evidence in Table 1 showing that the non-diffusible hydrogen content and fracture stress are not inherent properties. The Examiner's apparent refusal to either review Applicant's evidence or explain why Applicant's evidence is insufficient is strongly traversed, as it violates Applicant's right to due process. Furthermore, the Examiner's failure to comment on the evidence presented is unnecessarily prolonging prosecution in this application.

Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge readily available to one of ordinary skill in the art. *In re Kotzab*, 217 F.3d 1365, 1370 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*,

958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). There is no suggestion in Takemura et al. ('232), Takemura et al. ('688), and Maeda et al. to modify the transmission component of Takemura et al. ('232) to provide the transmission component, as required by claim 5, and the tapered roller bearing, as required by claim 15.

The only teaching of the claimed transmission component and tapered roller bearing is found in Applicant's disclosure. However, the teaching or suggestion to make a claimed combination and the reasonable expectation of success must not be based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). The Examiner's unsupported, conclusory assertions are not sufficient to establish a prima facie case of obviousness.

In view of the above remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP

Bernard P. Codd
Registration No. 46,429

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 BPC:MWE
Facsimile: 202.756.8087
Date: October 9, 2009

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